

# Stensat Radio Beacon

Stensat Group LLC

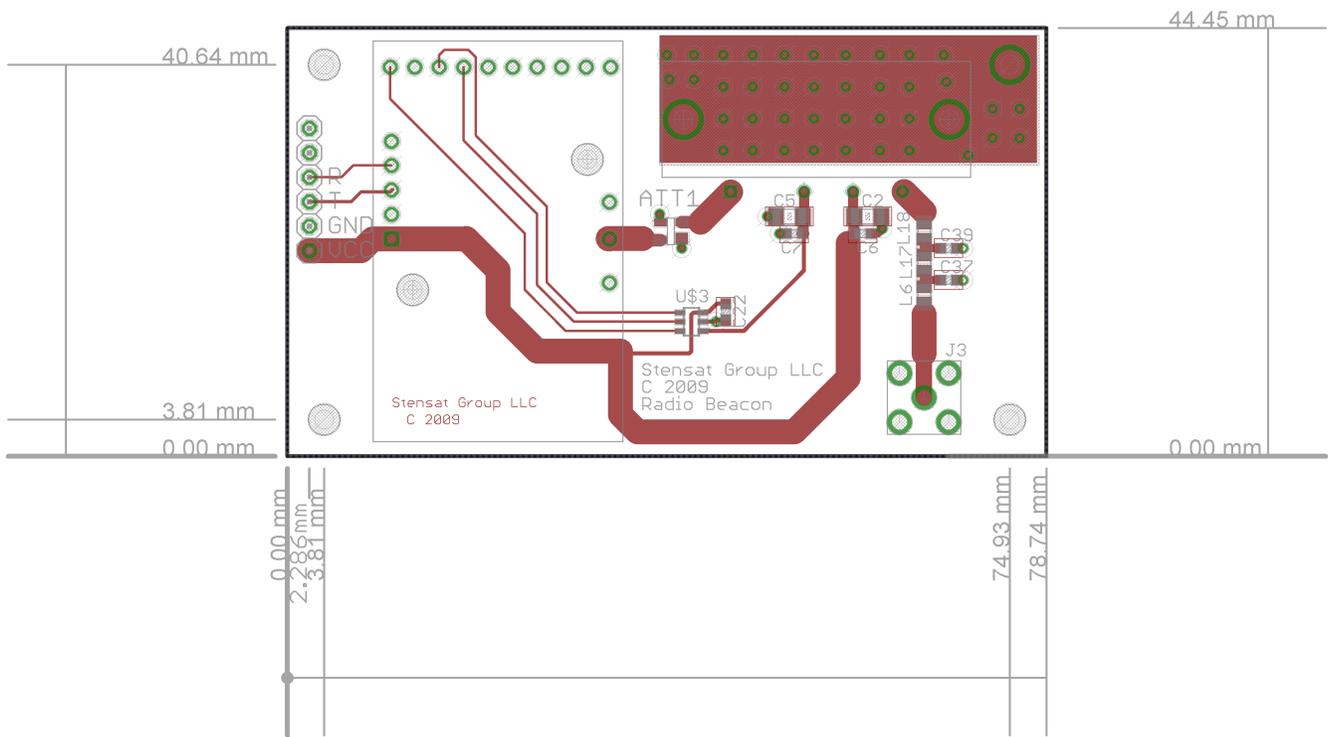
## Introduction

The Stensat radio beacon is a small FM transmitter capable of generating AX.25 Unnumbered Information (UI) packets at 1200 bps AFSK and 9600 bps FSK. The 9600 bps FSK signal is compatible with G3RUH modulation. Power level is adjustable from 0 to 1 watt operating on a single 5 volt supply.

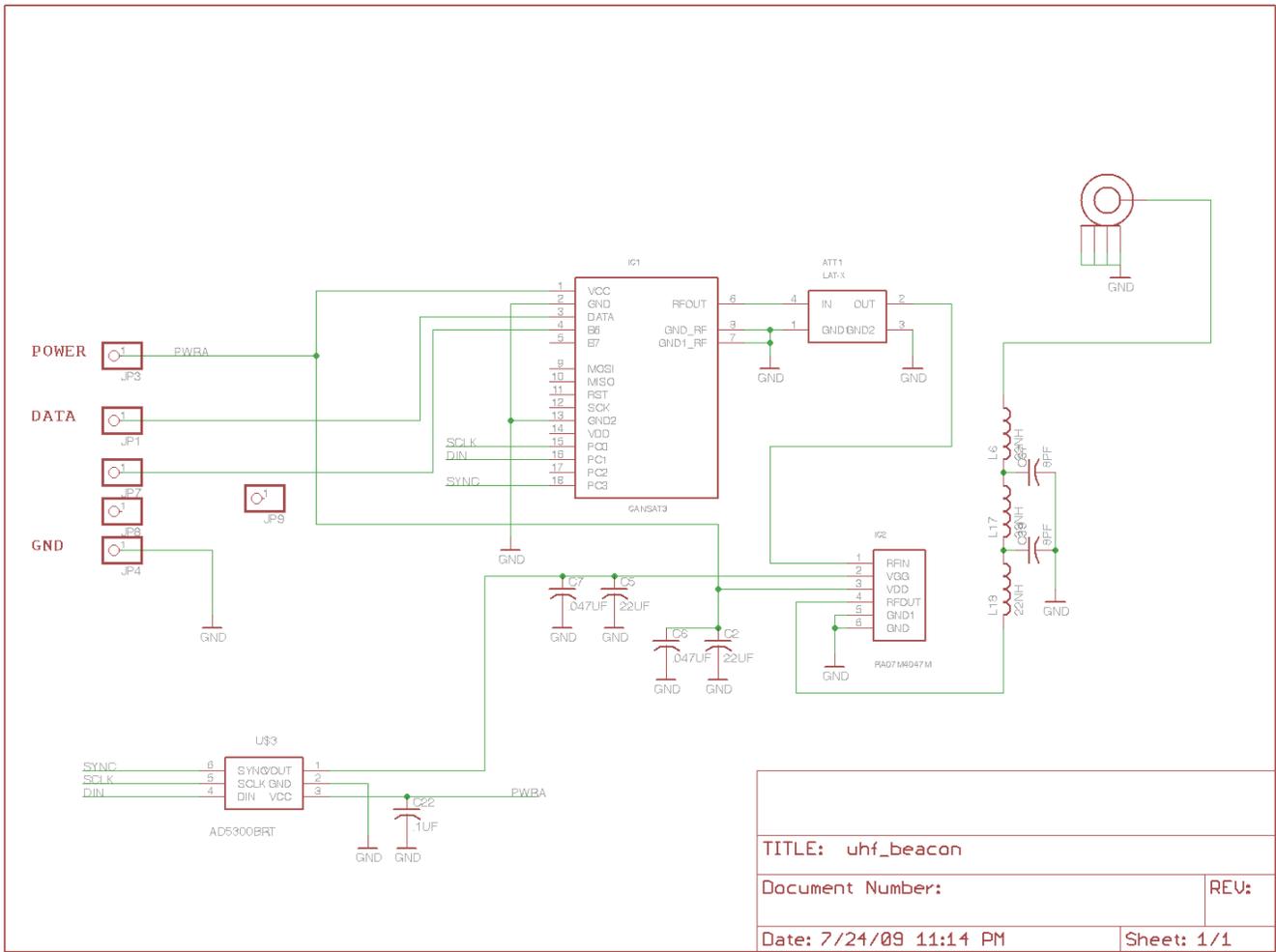
## Specifications

Item	Value
Bands available	2m, 70cm
RF Output Power	0 to 1 Watt programmable
Operating voltage (Vdd)	5.0 volts
Operating Current	650 ma when transmitting 40 ma when idle
Serial Interface rate	38.4Kbaud UART 8 bit, no parity, one stop bit
Dimensions	1.75 x 3.10" x 1.00" / 44.45mm x 78.74mm
Mass	approx. 50g
Digital Input signal specifications	High signal > 0.7*Vdd Low signal < 0.3*Vdd, 10 uA
Digital Output signal specifications	High signal > 2.0 volts Low signal < 0.4 volts, 3 ma sink
Mounting Holes	.125 inches, 4-40 mounting hardware
Frequency Ranges	
	SRB-51-01 420-450 MHz
	SRB-51-02 144-148 MHz

# Dimension Drawing



# Schematic



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## Connection Information

### 6 Pin Header (J1)

Pin	Description
1	VDD, Positive supply, 5 volts
2	Ground
3	Serial Data In, 38.4Kbaud, 8 bit, no parity, one stop bit
4	Serial Data Out, 38.4Kbaud, 8 bit, no parity, one stop bit
5	NC
6	NC

## Command Set

Command	Description	Format
C	Set source Call sign	Ccccccc<CR>
D	Set Destination call sign	Ddddddd<CR>
V	Set Via (relay) call sign	Vvvvvvv<CR>
S	Send ASCII String	Ssssssssss...sssss<CR>
F	Set the Frequency	Ffff<CR>
M	Set the bit-rate Mode	M1200<CR> or M9600<CR>
P	Set the RF power level, value is 2 digit hex	P00<CR> to P9c<CR>

All commands are ASCII sequences terminated with a carriage return character (<CR>; hex 0x0D; decimal 013.) Line Feeds (<LF>; hex 0x0A; decimal 010.) are discarded. The first character of the sequence is the Command character identified in the table above, and is always capitalized (the commands are case-sensitive.) Immediately following the Command is the user data parameter. The command is terminated with a <CR>. Individual bytes are sent to the Transmitter Module in the desired order of transmission, beginning with the byte immediately following the Command character.

An acknowledge response is returned after execution of any command. The response is “ACK<CR>”.

Call signs can be no larger than six characters, but may be less than six characters. If fewer than six characters are provided, the Transmitter Module will add trailing spaces to the six-character call sign per the AX.25 specification. The Transmitter Module does not check for valid call sign formats and will transmit whatever is entered. Some TNCs will not decode packets with malformed call signs.

The three call sign parameters have the following power-up default values:

Source - CANSAT  
Destination - CQ  
Via - TELEM

When sending an ASCII string, only ASCII characters are valid as data. Control codes will confuse some TNCs. Up to 200 characters can be transmitted in one packet. Transmission of the AX.25 packet starts immediately upon detection of the carriage return. During the RF transmission period, the Transmitter Module will disregard inputs on the serial command interface.

Setting the frequency requires a detailed understanding of how the synthesizer generates the RF frequencies. A table of values is available on the Stensat website to help in selecting frequencies.

The baud rate Mode command allows selection of either 1200 bps AFSK or 9600 bps FSK. Mode changes may be made at any time, and become effective immediately.

Power setting command requires a two digit hexadecimal value. The maximum value is 0x9c. Larger values may cause excessive current consumption.

## **Example C Code**

This example is used to show how the commands are formatted. Actual methods to perform serial communications will vary depending on the host system implementation.

```
#include <stdio.h>

int number;           // example variable
char cmd[200];       // command array to send to transmitter

main()
{
    sprintf(cmd,"CKM4JDG\r");    // set source call sign to KM4JDG
    send_serial(cmd);
    send_serial("P9c\r");       // set the power level
    send_serial("M9600\r");     // set the operating mode to 9600bps FSK
    number = 5;
    sprintf(cmd,"Sthis is a test of the data packet transmission number %d\r",number);
    send_serial(cmd);           // send the above string
}
```

## Ordering Information

<u>Part Number</u>	<u>Description</u>
STM-51-02	Radio Beacon, 430 MHz (70cm) band, no SMA connector
STM-51-02-C	Radio Beacon, 430 MHz (70cm) band, SMA connector installed
STM-51-02-M	Radio Beacon, 430 MHz (70cm) band, MCX connector installed
STM-51-03	Radio Beacon, 144 MHz (2m) band, no SMA connector
STM-51-03-C	Radio Beacon, 144 MHz (2m) band, SMA connector installed
STM-51-03-CM	Radio Beacon, 144 MHz (2m) band, MCX connector installed

If ordering the beacon with a connector, the customer can specify the type such as straight or right angle. For right angle connectors, the customer needs to specify the orientation.